

PIONEERS OF MODERN INDUSTRY IN CHINA.

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PREFACE.

THE Author, in his sketch of the career of H. E. HSUEHSI CHIH-CHI CHOW, has in a few words defined that quality in him which essentially distinguishes him among the great makers of the new China — his ability to discriminate between reality and appearance. Revolution, whether economic or political, is apt to be a confusing thing to contemporary observers. The changing conditions in which they live are so close upon them that it is hard to determine the relative value of the successive phenomena of change; as for a man lost in a forest it is difficult to find his true direction simply because he cannot see the wood for the trees.

We are all servants of the time and tide which come to all men; stewards, each good or bad in his degree, of opportunity. That man is the best servant of the age who most nearly apprehends the demands of necessity, and points out to the generality of men, not so much what might happen or what ought to happen, as the best way to marshal their resources in face of what must happen. We cannot write the future according to our desire until we can command the present for alphabet.

The true revolution in China was not the deposition of the Empire and the establishment of republican political machinery in Peking any more than the true revolution in France was the Parisian Terror or the Noyades of Nantes. These are results of the process

of change, not the process in itself. The individual does not exist who has the authority to pronounce whether change is good or bad for China. The fact is that the tide of blind forces has broken down the barriers which once kept China a nation apart, just as it is breaking down all the barriers that yet remain dividing ocean from ocean, land from land and nation from nation. Civilisation is moving inevitably towards an era of universality. What the features and exact character of a universal civilisation may be, no man can accurately predict — its forms of government, economic organisation, or structure of society.

We can appreciate the trend in that direction, and we can realise that the most important factor working towards it in our generation is modern industrialism, which is making the nations of the world into interchangeable parts of one great mechanism. His Excellency Hsuehsi Chih-Chi Chow's title to eminence is based on his vision of this necessity of circumstance ; his realisation that the problem of China is not whether it shall be incorporated into the general scheme, but how best it may be incorporated ; how the Chinese people are to adapt themselves to the industrial revolution without losing their individuality.

It cannot be doubted that had there been more men prone to quarrel over Imperial or Republican, or Christian or Traditional, or military or pacific appearances, and fewer men with His Excellency's instinct for reality, the forces which urge the activities of other nations would have bound China to a period of tutelage under alien rule. The Chinese, however, are a nation of realists,

and the genius of the people has worked its own salvation in producing such men as the founder of the Chee Hsin Cement Co., the Wah Hsing Cotton Mill and the National Industrial Bank of China. These and the other enterprises of which His Excellency has been the inspiration prove that when the forces of the modern revolution have leavened the whole of China, for all that she may have learned from the methods she is adopting from the West, she will emerge as Chinese as France is French or England English, her integrity unimpaired.

This is not to say that an industrial civilisation is the best of all possible societies, nor that this Steel Age in which we are set to make the best of our opportunities, combines the virtues of the Golden Age with the creature comforts that succeeding generations have elaborated since pastoral simplicity went out of fashion. China will in time be faced with the evils of industrialism, where now almost nothing but the advantages is visible. If, however, she can in that day rely on the aid of men of the calibre of those who, with His Excellency Hsuehsi Chih-Chi Chow have shewn her the way to find her own salvation in the past generation, she can rely on solving all the problems that will from time to time confront her. The strength of a nation is in the men who do efficiently and thoroughly what must be done.



SECTION I

H. E. HSUEHSI CHIH-CHI CHOW

The object of this essay being to sketch the efforts of H.E. Hsuehsi Chih-Chi Chow towards the industrial development of his country, a very brief account of his life before he became interested in commercial and manufacturing activities in China will be sufficient.

He was born in the year 1865, in the province of Anhui, the fourth son of His Excellency Chow Fu, sometime Viceroy of Shantung, Kiangsu and Kuangtung in succession, and his education, like that of most young Chinese of his class, was chiefly literary.

In his early days he followed, like his father, an official career and nothing happened to disturb the ordinary calmness of his life until the advent of the Boxer War, with all the lessons it taught the Chinese people in general and men of his rank and intelligence in particular.

It was during this disastrous period that his thoughts first turned towards the necessity of renovating the existing order of things in his country ; but unlike most Chinese of his generation, he conceived that this change must be of an economic rather than of a political character. His growing interest in industrial development and all the problems it presents did not at first suggest to him the idea of abandoning his official career-indeed, he considered the official position rather as a help than a hindrance in the realisation of his ideals.

In 1903, His Excellency Yuan Shih K'ai, then Viceroy of Chihli Province, remarking his interest in such matters, sent him to Japan to study and report on modern industrial conditions in that country. This mission had a profound and lasting effect on his mind ; awakening him, as it did, to the results that modern science could achieve when applied to the industries of the Orient. On his return from Japan, he was appointed Director of the new Government Mint in Chihli, one of the first institutions of its kind to be established with modern equipment in this country.

Soon after, he was promoted to the position of Director General of the Bureau for Industrial Development of Chihli and it was really with this appointment that his industrial career, properly so termed, commenced. During his tenure of office, the Bureau was stimulated into sustained activity, achieving its most remarkable results in the year he remained its director. Within a comparatively short time, over sixty branch offices and factories were opened in the different urban and prefectural districts of the province.

The Technical College of Tientsin, which is still furthering the purposes it was designed for and the alumni of which have in many cases greatly distinguished themselves in their subsequent careers ; the Model Factory, set up to train artisans in the crafts of dyeing, weaving, printing, carpentry, the manufacture of soap, porcelain and matches ; painting, embroidery &c, of which I shall have occasion to speak later on, as well as many other less famous but equally useful institutions in different parts of the territory cared for by the Bureau, are among the ventures launched during his directorate and under his auspices.

The policy of the Bureau during the period of his management was concentrated on encouraging by all possible means the establishment of small factories throughout the province. For this purpose the Model Factory, which drew its apprentices from many different districts and sent back its trained labourers, after the completion of their course, to the regions from which they had originally been drawn, was inestimably useful.

With the object of replacing manual labour by machines, the Peiyang Machine Works, fitted up for the manufacture of machinery on a small scale, was established at Tientsin and a branch factory was subsequently opened at Taku. A government owned Paper Mill and a factory for the manufacture of all kinds of educational instruments and appliances were also set up in Tientsin. An Exhibition of native products was held in the same town, a Zoological Garden and public park laid out and a Botanical Garden, with an area of over 1000 *mou*, was devoted to the conducting of experiments in agriculture and reafforestation. At about the same time, the Bureau lent its financial support as well as its no less valuable moral encouragement to the establishment of a Weaving, Dyeing and Sewing Factory, a Tooth Powder Mill and a Glass Manufactory.

The necessity of cooperation, so essential to success, between an official class initiating and encouraging enterprises of this nature, and the investors of capital, on whom the burden of carrying them must eventually fall, was not lost sight of by His Excellency. To the end of affording the two divisions, both

working towards the same purpose, an opportunity of meeting and exchanging views and ideas, an association was formed, under the auspices of which periodic meetings for the discussion of industrial problems took place.

Nor was the educational question forgotten—schools were opened and all measures taken to provide workmen in the government factories, as well as those in private employ, with the instruction so badly needed. An orphans' ward, a widows' almshouse and a kindergarten were supported, as was also a woman's factory, in which women of the poorer classes could learn some craft enabling them to earn an independent livelihood. In this, and other institutions of a similar nature (like the women's hospital) Mrs. Chow and her daughters took an active part. The phenomenal development of the province of Chihli excited much interest throughout China, in both Chinese and Foreign circles; and optimists, seeing that the other provinces were beginning to show a desire to emulate their northern sister, regarded China's regeneration through industry as an accomplished fact. But at this critical time, when the leadership of experienced men was more than ever desirable, the bereavement of his mother led to the resignation and retirement of Mr. Chow from his post and, as was to be anticipated in China, his successors quietly allowed the work so brilliantly begun by him to remain in the unfinished state they found it in.

Mr. Chow was subsequently appointed Director of the Peking Water Works and, mainly through his energy, the entire

work of laying down the pipes and establishing the plant was accomplished in less than two years.

But, however much Peking benefited by his presence there, the country at large was the loser by his retirement from the Bureau in Chihli. The lack of interest displayed by those who came after him in that important post resulted, as has been indicated already, in the rapid decline of the once flourishing industrial institutions set up with so much expenditure of money and pains. Fortunately, some of the seed had fallen on good ground and however disappointing the immediate results turned out to be, owing to this unexpected interposition of fate, time proved that his efforts had not been altogether wasted.

The most remarkable monument to his work during the period we have just passed under review and a monument that would alone prove a good title to fame, exists in the flourishing weaving industry of Kao Yang, in Chihli.

The people of this district learned the art of weaving from the returned apprentices of the Model Factory and the introduction of the improved hand loom is no minor factor in its development. Where in 1902 there existed but two looms, there are over thirty thousand today. The annual production is about 100 million yards of cloth, valued at over sixty million dollars. This result alone should be sufficient to make the name of the Bureau remembered with respect.

With the advent of the Republic, Mr. Chow was raised to the position of Minister of Finance and his sphere of action was

naturally greatly widened. He was twice appointed to the office, first in 1913 and again in 1915. During his tenure of office in that Ministry, he strongly supported and consistently adhered to the principle that the administration of the national finance, must depend on the national wealth ; and the increase of this wealth must depend on the expansion of industry. In his first declaration of his policy before Parliament, he laid all emphasis on this point. After explaining his policies on Taxation, National Bond Issue, Currency Improvement and the Central Banking System, he advanced the axiom that increase of productive power must precede increase in taxation. Among other important proposals, he advanced these three ; namely, the institution of a uniform Banking System throughout the country, so that loans at low interest for productive purposes might be procured in the country itself ; the abolition of Likin and other vexatious taxes which do not protect but only hamper commerce ; and the operation by the government of some of the larger industrial enterprises. Among the enterprises covered by this last proposal, he named the copper mines of Yunnan, the oil fields of Shensi, the iron mines of Likowyi, the gold mines of Chaoyangfu, the development of the port of Chinwangtao, the construction of railways throughout the country and the reafforestation of the barren hills along the banks of the Yangtze, as well as cotton spinning and other kindred industries.

After discussion of his policies, it was decided that a certain sum of money should be set aside each year for the development

of national industries and Mr. Chow was as good as his word, for within a year a large sum of money had been saved for the purpose named. About this time, the Wah Hsing Cotton Spinning and Weaving Co. was organised, with his support; the floatation of the National Industrial Bank was in progress and the regulations for the Farmers' and Labourers' Bank published. Two branches of the latter bank were opened in the suburbs of the capital and other cities were instructed to follow suit.

Unfortunately, the money set aside for this beneficial purpose was misappropriated during the Monarchical Movement of 1917 and this resulted in Mr. Chow's resignation, which was accepted. This resignation marks the end of his political life and, at the same time, the disappearance of any active interest the government has ever displayed in the industrial development of the country.

Disgusted with politics Mr. Chow now renounced the idea of combining official life with his interest in industry and, giving the former up for good, turned his whole attention to commercial and industrial affairs.

However, it must not be inferred from this statement that he decided to give his whole time to the accumulation of personal wealth, while consigning the welfare of his country and the happiness of his countrymen to oblivion. On the contrary, his belief has always been that the final and permanent pacification of China can only be brought about by the industrial regeneration of the country, for that alone can provide the progressive classes with

legitimate sources of wealth and thus eliminate the vicious practice of entering politics merely and openly for gain. Economic stabilisation will at the same time offer to those of the lower classes who are at present driven into the hazardous trades of robbery, piracy and banditry, the prospect of a substantial, a safe and an honest way of life.

The reason for the failure of repeated efforts to secure settled conditions in this country by force of arms or political intrigues can readily be understood. The present state of unrest in China is manifest in its troubled politics but the roots of discontent lie deeper than the superficial politics which are the common topic of newspapers and tea houses. Economic conditions weigh heavily in the balance. The root of the trouble is economic and by economic measures alone can it be eradicated, although politics can be applied to influence the economic conditions of the country. The increase of population in China has been out of all proportion to the increase of the means of livelihood. The result has been the advent of a state of chronic unemployment on a large scale and this unemployment will not be alleviated under present conditions, rather the opposite. What is needed, and urgently needed, is the establishment of factories to give all this people a chance to obtain their living in an honest way — the restoration of peace will follow in the ordinary course of things, without or despite the efforts of politicians.

Mr. Chow, as can be seen from his political career and private enterprises, has always held the theory that stable conditions

in China will follow when the sources of wealth are properly developed. The able and enterprising will then be able to attain power and wealth by the exercise of their talents in organising and directing the wealth of the nation as a whole, while men of minor calibre can find secure and profitable employment in less important capacities. If enough people are interested in the great possibilities which China possesses for the development of wealth and prosperity, a public opinion will automatically be formed which will demand and secure the protection and fair treatment of commerce and manufacture. As soon as there is enough wealth in the country, widely enough distributed, and those who are interested in it are suitably organised, they will be able to bring enough pressure to bear to run the government of the country according to its economic and social needs. Political issues will become more and more questions of method rather than of individual ambition. Indeed the individual will tend to become merged in the class. The mechanical side of government will, it is to be hoped, become the province of a professional class of civil servants, independent of political bias. Such a class can only be supported by a country in which conditions are stable and economically influenced in a minimum degree by the complexion of the political government.

One of the most important of Mr. Chow's larger industrial undertakings is the Chee Hsin Cement Co., which was organised in 1905, a few years before the downfall of the Ching Dynasty. The capital of this company is now ten million dollars and its capacity one million five hundred thousand barrels annually. The

Lanchow Mining Co. was organised in 1909 in opposition to the Chinese Engineering and Mining Co., as a result of the government's decision to reclaim this coal field. In January, 1911, a rate war commenced between the two collieries, during the course of which the price of coal fell to an exceedingly low level and thus caused heavy losses to both companies. Intermittent negotiations took place during the whole of the year 1911 and finally, in January, 1912, an agreement was signed by which the management of both concerns was united under the Kailan Mining Administration. The present annual output of the joint mines is over four million tons. The capital of the Lanchow Mining Co. is £1,000,000 and the net profit for the fiscal year 1922/3 reached the figure of \$3,243,250. These two concerns, the Lanchow Mining Co. and the Chee Hsin Cement Co., although started in the early stages of Mr. Chow's career, are still the core of his industrial interests.

The Wah Hsing Cotton Spinning and Weaving Company has also made very rapid progress. The paid up capital of the Company amounts to over ten million and the total number of spindles in the Company's four mills is 105,000.

The National Industrial Bank of China, although first proposed during his ministry, did not mature until some years later.

The Pu Yu Machinery Co. and the Wah Hsin Bank are among his more recent undertakings.

In 1919, he was appointed chief of the Cotton Improvement Administration Bureau by the Government and while in this office created about eighty farms for experiments in cotton im-

provement and cultivation, American seed being introduced. He established a Technical School for cotton cultivation, spinning and weaving and an Association of cotton producers, and provided for a special department of the Bureau to translate all sorts of literature on the subject of cotton. It was also intended to set up a model mill with 10,000 spindles and an experimental laboratory for agricultural purposes and technical research. A proposal was put forward at the same time to reclaim the abandoned salt farms along the Chihli coast, by which scheme above four million *mou* of land would have been given over to cotton cultivation, thus increasing the production of the country by some one and a half million piculs. The survey of the region in question and the plans for irrigation had all been prepared, when lack of co-operation on the part of the government and the consequent shortage of funds caused the whole scheme to fall through. It is owing to the uninterested attitude of the people concerned towards this and similar ideas that a shortage of cotton, such as the one recently experienced, recurs from time to time.

In addition to the interests of his private career Mr. Chow has always been distinguished for his philanthropic generosity. When famine and drought oppressed the northern provinces of China in 1920-1921 to an unprecedented extent, he showed great generosity and sympathy in the undertaking of relief work. Out of his private purse he found large sums for the establishment of huts to shelter the many thousands of refugees who flocked into Tientsin. He assisted in forming an executive committee to dis-

tribute clothes and rations, and provide necessary medical attendance. Strict order and discipline were kept and the next spring the refugees were sent back well - fed and healthy to resume their labours on their farms.

When the news of the Japanese earthquake catastrophe of 1923 was reported, he was one of the first to make large contributions to the relief funds.

In his native prefecture of Ch'owpu he established a benevolent institute through which alms are given to widows, orphans and the blind. He also erected special silos for storing grain, to be bought in autumn and sold in spring in order to equalise market prices. He also built a hospital with a dispensary, and a medical school. Other interests of his were in the formation of an association to encourage afforestation of the barren hills so abundant in the district, and a society to promote the planting of mulberry trees to assist sericulture. Efforts were made to improve the planting and manufacture of tea, which is a product of his native district. He also encouraged an organisation to instruct people in hand weaving and distribute yarn in exchange for the piece goods manufactured. Thus in a place where the conditions did not favour industrial enterprise on a large scale he spared no effort to secure crafts and trades for his own country folk.

In the sphere of education, he has established a commercial school and also a school for the study of Chinese literature and the classics, which owing to the enthusiasm for modern education in China have in some schools not been given due attention. A

firm believer in the spiritual value of moral teachings, and the great value of China's ancient traditions, he has also reconstructed the local temple of Confucius, the great sage of China.

It is of course true that Mr. Chow's success was not entirely due to his own efforts nor to employment of his own capital exclusively. But it can with equal truth be asserted that without his broad minded views, his readiness to cooperate with all comers, his willingness to subordinate his own immediate interests to the common interests of all concerned, his sound business instinct, leading him to judge with accuracy between sane schemes and adventures; and above all, his inexhaustible personal energy, the companies, in the floatation and subsequent management of which he took a leading part, would never have attained anything like the success they did actually achieve.

SECTION II.

THE CHEE HSIN CEMENT COMPANY, LTD.

Of all the pioneer industrial establishments in China which contribute to the general economic reorganization of the country and have maintained a brilliant and lasting success financially the Chee Hsin Cement Company of Tientsin, North China, must occupy the foremost place. The cement industry in North China made its first appearance with the establishment in 1886 of the Tangshan Cement Factory, an enterprise undertaken by Mr. Tang Ting Chu with a capital raised from both public and private sources. This enterprise did not prosper and collapsed after a brief existence. In 1900 Mr. Chow, who has played such an important role in the industrial development of North China, stepped in where his predecessors had failed and resolved to make another attempt. He appointed Mr. Li Shi Ming and Dr. Gunther to organise the Chee Hsin Cement Factory, the capital being advanced from the then existing Kaiping Mining Administration. Soon afterwards, the Boxer troubles broke out and this enterprise found itself in serious financial difficulty. Through the efforts of Mr. Detring, at that time Customs Commissioner of Tientsin, the Chinese Engineering and Mining company advanced funds to the company and obtained a lien on its products with an understanding that the arrangement might terminate at any time on giving three months notice. In 1906 the restitution to Chinese control was effected by Mr. Chow

and owing to the obsolescence of the old plant, new capital was raised to instal new plant. The sponsors of this movement, H. E. Hsuehsi Chih-Chi Chow and Mr. Sun Toa Sun were appointed General Manager and Assistant General Manager respectively. Under this management, the company was carried on more successfully than at the first attempt. The sub-depot at Machiakow was established in 1908. At an extraordinary general meeting of the shareholders in December, 1911, it was resolved to form a new company in accordance with the commercial law of China for limited liability companies, to take over the undertaking of the original Chee Hsin Cement Co., Ltd.

Thenceforward, the company has enjoyed a state of prosperity uninterrupted for many years and matched by very few industrial establishments in North China. In 1914, this company took over the management of the Hwa Kee Hupeh Cement Works as the result of a loan of one million four hundred thousand taels granted to the proprietors, which has also been increased in the last few years. The Hwa Kee Hupeh Cement Works have since been constituted a branch of the Chee Hsin company although the accounts are kept separate. From the formation of the new company a series of extensions to the plant was effected and an equipment on an extensive scale of kilns, mills, crushers etc. was installed. The installation is thus brought entirely up-to-date and a high degree of productive efficiency is attained.

Capital: — The reconstructed company was started with a capital of one million Chinese dollars and the capital issued is

now increased to twelve million Chinese dollars (\$12,000,000) divided into 1,200,000 shares of \$10 each. Sixty per cent are registered shares held by Chinese alone. Forty per cent are bearer shares and may be held by persons of any nationality. The paid-up capital in 1922 was \$8,800,000 with a little more than one million dollars worth of debentures called "Industrial Bonds" unredeemed. The reserve fund is 1,768,356.65.

Management : — The Company has its head office in Tientsin. The general control of the business of the Company is entrusted to a Managing Director and an Assistant Managing Director who also act as the chairman and the vice-chairman of the Board of Directors. To the works at Tangshan is assigned one factory manager with a large staff of Technical experts and clerical assistance. In order to meet the requirements of its tremendous volume of business, the company has also organized a sales department on an extensive scale with many sub-offices and Agencies in various business centres in both North and South China.

Business : — The principle business of the Company is the manufacture of portland cement, concrete poles, drains, mosaics, paving, roofing, and ridge tiles, clinker tiles, household utensils etc. In spite of the disturbed conditions now existing in many parts of China, the demand is always heavy. Cement is being extensively used in railway, harbour, mining, bridge and other foundation works all over China. The Peking-Hankow, Tientsin-Pukow, Peking-Suiyuan and other railways have used the Tangshan Portland Cement with the best results.

Works :— The Works of the Company are situated at Tangshan, half way between Tientsin and Chinwangtao, on the Peking-Mukden Line. At this place the conditions for manufacturing portland cement are exceedingly favourable owing to the existence of all necessary raw materials such as limestone, clay and coal, which exist in huge deposits. The company has secured large areas in order to have sufficient raw materials for any number of years to come.

Plant :— The plant of the company is equipped with the newest and best types of machinery. The process employed and the plant installed throughout are especially designed by the well-known cement work designers Messrs. F. L. Smidth & Co., Copenhagen and New York. It represents not only the largest but also the finest cement factory on Chinese territory and compares well with any cement plant in the world with regard to its up-to-date equipment and methods of working. The erection of the new extension plant was only completed in the winter of 1922 and it has been in operation from January 1923.

As the new plant has the more important equipment we will go into more detail as follows :

The Raw Materials Mill and the Finishing Mill are in the largest of the new buildings. They have floor areas respectively of 36,000 and 4350 sq. ft., and average 65 ft. in height. Both are of fireproof construction, being built entirely of reinforced concrete and brick, with corrugated iron roofs on steel trusses.

In laying out the new plant a unit system was followed so

that not only can the new plant be operated in conjunction with the old plants in practically every department, but new units can easily be added at any time, should the conditions of the market justify a still further increased output of cement.

All of the machinery in the new plant is driven by electric motors which represents the most recent practice. Many of the machines are extremely heavy and require a large amount of power to start them moving from rest, and some of the heaviest parts revolve at very slow speeds. To drive such a load without using a large number of gear reductions or belts requires motors which are of unusual type and are expensive, and these have been used only in the most up to date plants.

For the new plant alone there are motors aggregating over 3000 H. P. Some of these are quite large, there being five of 300 H. P., two of 200 H. P., and six of 100 H. P., for driving the larger machines. The remainder are in units of from 25 to 50 H. P. each and are used for driving conveyors, fans, elevators, etc. All motors are of 3 phase, 25 cycle, alternating current type, the small ones operating at 220 volts and the large ones at 2200 volts. The latter voltage is considered somewhat high for factory motors, but great care has been taken in their installation and no difficulty is anticipated on this score. Current is distributed to the high voltage motors by paper insulated, lead covered, steel armoured cables laid underground in brick ducts or in steel conduits, and by rubber covered cables to the low voltage motors. Ample electrical protection is afforded by the latest type of ironclad

switchgear, which also prevents personal contact with any high voltage parts. Small transformers in the plant supply the 220 volt, 3 phase power for small motors, and 110 volt, single phase for lighting.

In order to ensure reliable and uninterrupted electric service, power for the new cement plant is supplied from the Kailan Mining Administration's steam turbine plants. As this power is generated at 25 cycles, all of the motors in the new plant are built for that frequency. An outdoor type substation of about 4000 K. V. A. capacity is erected at the cement plant to transform the K. M. A. voltage of 30,000 to 2200 volts for distribution to the motors. A 1500 K. V. A. steam turbo-generator has been installed in the Cement Company's steam plant. This plant supplies power at 50 cycles for the old cement plant motors. The equipment consists mainly of a 1250 K. V. A., 3000 volts, 50 cycles, 3 phase, A. C. generator, driven by a 1500 H. P. horizontal compound steam engine. Boilers are equipped with superheaters, and jet condensers are used, cooling water being obtained from a nearby river.

As an example of the modern methods used there a 700 K. V. A. synchronous condenser has been installed for the purpose of raising the power factor of the load in the old cement plant. When this is in operation, not only is the power factor raised from .80 to .95, but an additional 200 K. V. A. can be supplied by the generator without increased heating.

The raw materials used in the manufacture of cement are limestone and clay, and a practically unlimited supply of both exists

on the Company's properties at Tangshan. The top soil furnishes most of the clay needed and underneath this is found the limestone which is mined by drilling and blasting with black powder. The drilling is done partly by hand and partly by air drills supplied with power from an electrically driven compressor plant. A motor driven winch hauls the material to a high point of ground and from here it is taken, by gravity dump cars on narrow gauge tracks, down a long slight grade to the top of the crushing plant. Here the limestone is broken up by gyratory rock crushers, and the clay by roller crushers.

Dump cars now carry the broken material to the Raw Mill building, separate bins being provided for limestone and clay. From these they fall by gravity to horizontal revolving feeding tables. There are eight of these tables, four for limestone and four for clay. Two tables, one of each type, feed to ball mills where the first mixing and grinding is accomplished. By varying the speed of the feeding tables the amount of material leaving each table may be altered, thus varying the proportions of the mixture.

The ball mills are heavy boiler plate cylinders revolving on a horizontal axis. Each one contains about 8800 lbs of steel balls which, as the mill revolves, grind the mixture into a fine powder. There are four of these mills and each is driven through direct coupled gearing by a 100 H.P., slow speed motor, which also drives one pair of feeding tables through variable speed reduction. From the ball mills the material passes on to a final grinding in three tube mills. They are similar to the ball mills in principle

and operation but are much larger and heavier. Each mill contains about 20 tons of grinding bodies, small steel balls and cylinders, and each is driven by a 300 H.P. slow speed, direct coupled motor.

During the whole grinding process, automatically driven samplers have been taking samples of the material. These are continually analysed in order to maintain the proper proportion of ingredients and so ensure a high and even quality of product.

In order to make cement in its commercial form the materials, which up to this point are merely ground and intimately mixed together, must be calcined, or burned. This is accomplished in the kilns, of which there are two in the new plant. They are immense hollow steel cylinders over 200 ft long, and 11 ft in diameter, lined with fire brick. Set on a slight slope, one end being 7 ft. higher than the other, and supported at four points in their length by rollers, they revolve at about one revolution per minute. A temperature of about 1500° C. is maintained in the kiln by burning powdered coal, which is blown in through a pipe at one end and ignited just as though it were a jet of oil or gas. A tall smokestack at the high end furnishes a natural draught which draws the hot gasses through the kiln. The building of these stacks was a nice piece of construction. In as much as they are 200 ft. high, 16 ft. outside diameter at the base, and 9.5 ft. at the top, the building of the first one in six weeks and the completion of the second in four weeks may constitute a record of its kind in China.

The raw material from the tube mills passes through an elaborate system of conveying, mixing and storing devices, and is finally fed in at the upper end of the kiln through which it slowly passes. It takes about two hours for any particle of cement to pass through, during which time it is thoroughly burned, coming out of the lower end of the kiln as "clinker". In this condition it is in small lumps and requires to be pulverised to become commercial cement. First however, the clinker must be cooled, so it is passed through another much smaller revolving drum through which air is being forced. In cooling the clinker the air is heated to about 400° C. This hot air is of value, part of it being used to dry the coal fuel, and part being injected into the kiln to furnish air for the combustion of the powdered coal. This is an economy which well repays the cost of its accomplishment, as in this way the cost of raising cold air to the temperature of combustion in the kiln is minimised. Each kiln is driven by a 100 H.P. direct coupled motor, which also drives the fan which forces air through the clinker cooler. Although much larger than the tube mills, the kilns require much less power to drive them as they revolve so slowly.

The great length of these kilns is a feature upon which depends in great measure the whole economy of this part of the process. A careful balance must be maintained between the time during which the cement remains in the kiln, the temperature of the exit gasses or products of combustion, the amount of hot air needed for combustion, and the amount required for drying the fuel. The proper proportioning of these factors has led to greater

and greater lengths, until the economic limit has been reached in these kilns, a careful analysis showing that any further increase in length will result in a decreasing economy.

The pulverising of the coal fuel is a separate process and is of interest in that this is one of the most economical known methods of firing. This department is equipped with drying, crushing and pulverising machines very similar to those performing the same functions in the cement plant.

Slack coal is used and is purchased from the K. M. A. mines at Tangshan. Although of a quality not well adapted for use under most boilers or for household use, it runs fairly high in calorific value, so that by using it in the powdered form it gives as good results as much more expensive coal. It is first passed through roller crushers, and then through the drying drums below the cement kilns. When quite dry it is reduced to an exceedingly fine powder in the pulverising mills. There are three of these machines which are similar to the combined ball and tube cement finishing mills. They are 30 ft. long and 6 ft. in diameter, and each contains 11 tons of grinding bodies.

It is dangerous to store a large quantity of powdered coal as it is liable to explode, so it is pulverised only as needed and at the same rate that it is used. The nozzle for burning the coal dust is merely an iron pipe, projecting into one end of the kiln. The dust is forced into this pipe, by a worm screw feed, a short distance back from the end and blown through the nozzle at high speed by compressed air.

After the clinker has been cooled it is taken to the clinker sheds where it is merely piled up and allowed to stand for some time. While not absolutely necessary, it is the practice here to allow the clinker to age for about six weeks. For one thing this provides a six weeks storage which can be heavily drawn upon in case of rush orders, and also provides a means for allowing the Finishing Mills to operate continuously in case of a shut down of any part of the Raw Materials Mills.

In the Finishing Mill there is but one operation necessary. The clinker is passed through compound ball and tube mills. These are the latest type of finishing pulverising machines, and consist of a tube mill and a ball mill combined in one cylinder containing about 25 tons of various grinding balls and cylinders. There are three of these mills, each driven by a 300 H. P. direct coupled motor. As it comes from these mills the pulverised cement is of such fineness that all but about 12% of any mass will pass through a No. 180 sieve, made of very fine brass wire, having 180 meshes to the lineal inch, or about 38,000 holes to the square inch.

The cement is now weighed. It is taken by conveyers to scale hoppers which gradually fill until they contain exactly one barrel, or 375 lbs. This charge is then automatically registered and discharged on to a travelling belt which conveys it to the stock silos. Three huge concrete silos, 56. ft. high by 52 ft. diameter, provide storage space for 60,000 barrels of finished stock. Projecting through the concrete floor of each silo into the space

below are 13 spouts. A barrel is placed on a packing machine with automatic scale below a spout and cement falls into it until it contains exactly 375 lbs., when a valve in the spout is automatically closed. The head is then nailed into the barrel and the cement is ready for shipment.

Filling, handling and shipping 5000 barrels of cement every day is in itself no mean industry, as it entails the making of all of the containers used. Most of these are wooden barrels, but some iron drums are necessary for distant shipments, and some bags are used for local requirements. Side tracks from the Peking-Mukden Railway run alongside the stock silos, and when in full operation, an average of 45 loaded cars can be despatched in a day. A short run to Chinwangtao allows easy ocean shipment to any part of the world. Although considerable shipments have been made to the Philippines, Java, etc., most of the cement is sold in the Chinese markets, and the company is optimistic as to the ability of China to absorb their increased output.

Output : The yearly output of the old plant is 500,000 barrels of cement. The new plant increased this by 1,000,000 barrels, making a total production of 1,500,000 barrels yearly.

General features : It would be difficult to imagine a cement plant with more natural advantages than this company enjoys. An unlimited supply of raw materials is directly at hand ; coal is purchased practically at the mine shaft, ensuring the lowest cost of fuel and power generation ; power is also purchased from the K. M. A. which operates one of the largest generating systems in

China, thus ensuring an uninterrupted supply ; shipping facilities both by rail and water are excellent ; and, finally, labour is plentiful and cheap.

The business results of the company have been excellent for many years as may be seen from the following table in which the amounts of net profit earned during the last five years are given :

1918	1919	1920	1921	1922
\$ 973,293.36	\$ 1,138,751.22	\$ 1,751,593.31	\$2,257,678.91	\$1,870,783.44

The rates of dividend paid to shareholders on the five years' working are as follows :

1918	1919	1920	1921	1922
7%	7%	10%	14%	12%

The balance sheet of the company as at December 31st 1922 is shown below :

LIABILITIES

Paid-up Capital	\$6,000,000.00
Increased Shares, Ordinary,	514,000.00
" deferred,	2,286,000.00 2,800,000.00
Industrial Bonds issued	1,236,070.00
Reserve Fund	1,768,356.65
Staff Savings & Pensions	604,281.69
Sundry Creditors	620,708.93
Various Agency Deposits	50,695.63
Unclaimed Dividends	20,687.58
Interest for 1922 and Unclaimed Interest on Bonds	34,605.87
Amount appropriated for the Divid- end on Increased Shares	211,093.22
Interest on Deposit of shareholders.	115,090.75
Unclaimed Premium on Redeemed Bonds	4,200.00
Amount appropriated from Profit a/c of the preceding years for Re- demption of Industrial Bonds	400,000.00
Balance-Net Profit for the year 1922 including surplus from 1921	<u>1,920,799.51</u>
	<u><u>\$15,786,589.83</u></u>

ASSETS.

Property Account—Land, Building, Plant, Machinery, Fixtures, Rights Trade Marks, etc. etc.			4,317,543.65
Less : Depreciation			279,171.44
			<u>4,038,372.21</u>
Plus Investment during the year			3,045,029.14
			7,083,401.35
Property & Stores of Hwa Kee			
Electric Works			77,159.55
Cement Clinkers.			91,783.50
Stores & Raw Materials.			1,090,265.72
Stock at Head Office & Various Agencies			57,270.82
Stock at Tangshan Works.			462,410.93
Works Outstanding Account — con- struction of Buildings, manufacture of machinery, etc.			441,716.44
Store Purchase a/c.			396,941.81
Shares investment a/c			672,260.69
Cash in Various Banks			1,273,059.45
Loans made to Hwa Foong Hsin Yeh Shei for taking over manage- ment of Hupeh Cement Works :			
First Loan Tls. 1,400,000.00			2,043,795.62
Second Loan			620,000.00
Third Loan			980,000.00
			3,643,795.62
Current Account with Hwa Foong Hsin Yeh Shei			13,647.82
Sundry Debtors			417,047.57
Cash in Hand.			65,828.56
			<u><u>\$15,786,589.83</u></u>

In view of the intensive activity shown all over China in the construction of railways, highways, harbours, mines, bridges and modern style buildings, and the quality of the Tangshan Portland cement, kept always at a high standard by a most scrupulous scientific control of the process of manufacture, the business possibilities of the company seem almost unlimited and very handsome profits appear ensured for many years to come.

MACHINE SHOP

As the machinery used in a cement plant is very heavy, the repair work becomes a very important factor. A shutdown of a few hours means a heavy financial loss. Therefore the repair jobs have not only to be executed with first class workmanship but must also be done in a short time. The Company has therefore built an up-to-date machine shop known as The Chee Hsin Engineering Works, situated to the east of the present site, occupying more than 100 *mou* of land which is ample for future extension.

The Engineering Works has five principal buildings, namely, machine shop, forge shop, riveting shop, foundry and pattern shop, occupying about 60,000 square feet of working floor space.

The shops are provided with the heaviest type of turning, planing, plate machinery and equipment, capable of handling the making of the heaviest machinery used in the cement plant such as large gears, shafts, driers, kilns, etc. A casting as large as seven tons has been successfully made in the foundry. The machine

shop has one 10-ton and the foundry has two 10-ton and one 5-ton three-motion electric overhead cranes.

The machine shop has a tool department making and grinding tools for various departments. All tools are standardised as far as possible. Instruction sheets for standard operations which are obtained from time study, are used on standard articles which are large enough to warrant the preliminary study. This in many cases enables work to be done in less than one third to one fifth of the time required under the old system.

The accounting of labour for the works is based on a modification of the modern machine rate method to suit the local conditions.

A steel foundry is now being erected to contain one half-ton Siemens Electric Arc Furnace and one 1-ton Bessemer Converter. The Company expects to make first grade cast steel for commercial purposes. A complete set of micrographic apparatus has been ordered from abroad for testing the quality of the steel cast.

The works is in charge of American and European trained engineers. Recently several large orders have been awarded to the Works and the products meet with great satisfaction. The outlook of the Engineering Works is highly promising.

SECTION III.

THE WAH HSING COTTON SPINNING AND WEAVING CO. LTD.

The Wah Hsing Cotton Spinning and Weaving Company Ltd., now considered to be the largest and most influential enterprise of its kind within the limits of North China, was floated in the year 1914.

Mr. Chow supported the venture very strongly, not only because he thought it a good business undertaking but also because he considered that, properly equipped and managed, it would serve as a model and example to other more timid Chinese capitalists and, encouraging them to embark on similar ventures, thus give a great impetus to the young industries of China. That it actually did serve this latter purpose, and to what extent, may be gathered from the fact that since the establishment of the Wah Hsing Company's Mills, over half a million spindles have been erected and put into operation in North China. The registered and paid up capital of the Company is ten million dollars.

The Company's original programme called for an installation of two hundred thousand spindles, but at the moment there are actually only one hundred and five thousand in operation. Four Mills, situated at large centres in three different provinces, are operated by the Company, the Head Office of which is at Tientsin.

To each of these four mills is assigned a Managing Director, who is held responsible for the plant under his control, the profit and loss account of each mill being kept separate. As an aid to the development of the Cotton Industry in China, the Peking Government promised to subscribe 40% of the capital but this promise has only been partially kept and, so far, the mills have only been subsidised to the extent of eight hundred thousand Dollars of Government money. The Company, however, enjoys the privilege of being protected by the provisions of the "Regulations for a special Government Grant to guarantee the payment of dividends." The promoters and present directors are all men who are prominent figures in Industrial, Commercial and Political Circles.

Perhaps the most remarkable feature about the mills controlled by the Wah Hsing Company is the fact that despite the Cotton crisis of 1923, they were able to show substantial profits though, of course, not, to the same degree as in previous years—nevertheless this constitutes an emphatic proof of the conscientious management and thorough business capacity of those responsible for the welfare of the Company.

TIENTSIN MILL

The Tientsin Mill was the first of the four established, the plant and buildings covering an area of two hundred and forty *mou*, and it commenced operations in July, 1919 with twenty-five thousand spindles, to which another two thousand were subsequently added. The machinery is of Saco-Lowell make. The mill has electric drive with two steam turbines, one of 1000 kw in opera-

tion, the other of 900 kw in reserve. There are two boilers with 5346 square feet of heating surface each, both being water tube type, manufactured by Babcock and Wilcox. The Mill Building is of the saw tooth type, but is not fireproof. Two thousand five hundred mill hands are employed, the counts spun being 10" 16" and 20". The annual production is about twenty thousand bales of 16" and the consumption of cotton about seventy thousand piculs. Tientsin being a Treaty Port and the principal cotton market in North China, the local supply of raw material is usually enough to cover the mill's requirements, while the ever growing population of Tientsin, with the other centres of business in Chihli province, provides a convenient outlet for the finished product. The extent to which the mill has prospered may be perceived from the subjoined table, which gives the figures for profits and dividends during the past five years.

Two months in 1st. financial year Jan./Feb. 1919	2nd. Financial year from Mar. 1919 to Feb. 1920	3rd. Financial year from Mar. 1920 to Feb. 1921	4th. Financial year from Mar. 1921 to Feb. 1922
Profits \$104,800	\$1,376,000	\$1,065,000	\$900,000
Dividend 16%	34%	28%	24%
5th. Financial year from Mar. 1922 to Feb. 1923			
Profits \$ 682,011			
Dividend 18%			

TSINGTAU MILL

The second of the Wah Hsing Mills is situated at Tsingtau, where it has been in operation for the last four years. The plant is erected over an area of three hundred and fifty *mou* of land, the mill being at the outset equipped with twenty thousand spindles, manufactured by the Whiting Machine Works in America. Twelve thousand spindles supplied by the Woonsocket Machine and Press Co., and the Fales & Jenks Machine Co., both of America, were subsequently added, thus making a total of thirty-two thousand spindles at present in use. The Mill is mechanically driven, having a Fitchburg compound engine and a Chuse engine. There are five boilers giving a total heating surface of seventeen thousand square feet. The Heating, Sprinkler and Humidifier Systems were all installed by the Parkes Cramer Co. of America. The original Mill building is of the saw tooth non-fire-proof type, but the new extension erected to house the Woonsocket Machinery is of reinforced concrete. The Mill employs two thousand five hundred men, for whose accommodation special villages have been built. The Mill is managed on the most modern and scientific lines. Clubs, schools and libraries are provided for the staff and for the labourers. Besides the lower counts, 32" is being spun by part of the mill. There are six Japanese mills in Tsingtau with 200,000 spindles and competition is in consequence very severe, but with its good management and strong financial backing the Wah Hsing Mill has been enabled to make steady progress as the accompanying table, showing dividends paid since its opening, will show.

First financial Year ending February	1920	.	.	.	.	.	8%
Second " " " "	1921	.	.	.	.	.	14%
Third " " " "	1922	.	.	.	.	.	18%
Fourth " " " "	1923	.	.	.	.	.	12%

Tsingtau is, with the exception of Hongkong, the best port in China for the accomodation of ocean going shipping and its industrial prosperity is bound to develop in time. As far as the cotton spinning industry is concerned, when the spinning of finer counts requires importation of cotton from abroad, the advantage of being in such a position, is obvious.

TANGSHAN MILL

The mill at Tangshan is very favourably placed indeed. It is close to the district that supplies the best cotton grown in China, in the heart of the industrial and mining area of Chihli and surrounded by a very thick population. The collieries and electric plant of the Kailan Mining Administration and the Chee Hsin Cement Company are in the same district.

The mill plant comprises twenty four thousand spindles, the product of Messrs. Hetherington & Sons of Manchester, while the Humidifying and Heating systems were made by Matthew & Yates, also of Manchester, and the Sprinklers by Witter & Son of Bolton. It has electric drive with directly coupled slip ring motor for each ring spinning frame, the power being supplied by the Kailan Mining Administration. The main building of the mill is of re-inforced concrete. The chief counts spun are 32" 16" &c. The mill offers regular employment to fifteen hundred men, working in

night and day shifts. Owing to late delivery of part of the plant, the full number of spindles only came into play in 1923.

WEIHWEI MILL

The Weihwei Mill is also very favourably situated, close to the trunk line from Peking to Hankow and deriving from this convenient proximity the best advantages in the acquirement of raw material and disposal of finished product.

Over twenty-two thousand spindles are in operation in this Mill, all of them manufactured by the Woonsocket Machine and Press Co. and the Fales & Jenks Machine Co. In one of the buildings, the Sprinklers installed are those of Witter and Son, and the Humidifying and Heating systems are of Matthew and Yates make and in the extension there are American systems installed by Parkes Cramer & Co. The power plant consists of one compound condensing steam engine of 800 HP and three Lancashire boilers. Fifteen hundred mill hands are employed in spinning the various counts, the chief of which are 20" 16" and 10". The mill was started in its finished state in 1922. Its present annual output is nineteen thousand bales and its consumption about seventy thousand piculs of raw cotton. A ready market for its products is found in the neighbouring provinces of Honan, Hupeh and Shansi, where comparatively few cotton mills have as yet been established.

SECTION IV.

THE LANCHOW MINING COMPANY, LTD.

The Lanchow Mining Company Ltd. was floated under the patronage of the late President Yuan Shih K'ai, then Viceroy of Chihli, for the purpose of exploiting the rich coal deposits in the Lanchow district. The actual promotion of the Company was entrusted to His Excellency Hsuehsi Chih Chi Chow and the original concession covered an area of three thousand and thirty square li. The mines first worked were the Machiako and the Chaokochwang, which are still the principal pits operated by the Kailan Mining Administration. The results obtained by the Lanchow Mining Company were at first fairly successful but their operations were greatly hampered by the fierce competition of the British interests working in the same district under the name of the Chinese Engineering and Mining Company, Ltd. The rate war that ensued was disastrous for both concerns and forced them into negotiations. By the tact and good judgment of the heads of the two parties concerned, these negotiations were brought to a successful end, and in January, 1912, an agreement was entered into by the two rival companies, by which agreement the Kailan Mining Administration was formed to take over the business management of both the Chinese Engineering and Mining Company and the Lanchow Mining Company. By this agreement, the constitution and internal management of each of the parties were left entirely intact but, as far as the public was concerned, the two interests

were merged into one. This scheme has worked to the satisfaction of all concerned and the happy results of the agreement prove perhaps better than anything else the excellent results that can be obtained by the co-operation of Chinese and Foreigners. The Mines now controlled by the Kailan Mining Administration are those of Tangshan, Machiako, Chaokochwang, Linsi and Tangchiachwang.

Tangshan. This colliery is worked by three large shafts of from fourteen to sixteen feet in diameter, going down to a maximum depth of fifteen hundred feet. The capacity of the present plant is fully two thousand tons per diem. The power station at Tangshan contains three alternators, each capable of developing twelve hundred kilowatts.

Machiako. Machiako Mine has a maximum daily capacity of two thousand five hundred tons. The electrical equipment consists of one alternator of eleven hundred kilowatts and one substation where current derived from the Linsi Mine at 3000 volts is transformed at 2200 volts.

Chaokochwang. Like Machiako, the Chaokochwang colliery is comparatively new, and a maximum depth of nine hundred feet has so far been attained, from which level coal is delivered through three shafts averaging from 13' to 15' in diameter. The output of the mine, however, is greater than that of any other pit outside of America. Five thousand five hundred tons are produced daily and it is anticipated that the output will shortly reach six thousand

five hundred tons. There is no power station at Chaokochwang, all the current required being transmitted from Linsi.

Linsi. Linsi is the main centre for the production of power; and the Washing Plant, for the cleansing of some of the lower grades of coal, is also situated there. The mine has at present an output of three thousand five hundred tons and it is hoped that before very long this figure will be increased by a thousand tons. A depth of one thousand feet has been reached by two vertical shafts, of from 14' to 15' in diameter. Two alternators of twelve hundred kilowatts and two turbo alternators of three thousand kilowatts each are included in the electrical equipment. New turbo alternators of six thousand kilowatts are now being installed in place of the small ones. When these have been completed, the capacity of the central station will be increased to eighteen thousand kilowatts. For the distribution of power to other mines, two high tension lines have been erected, thus reducing to a minimum the risk of any temporary breakage cutting the mines off from the source of power. The Washing Plant has been in use since 1915 and is capable of treating from one hundred to one hundred and fifty tons an hour, according to the quality of the coal that is to undergo the cleansing process. The equipment of the mine is in general of the most modern type and compares favourably with the best equipped mines in Europe and America. Electrical machinery is used throughout. There are about two hundred electric motors and above one hundred transformers in daily use.

The boilers at the various power stations have an aggregate heating surface of over six thousand square feet and require three hundred tons of coal daily. Mechanical stokers are in general use and hand stoking will shortly be entirely abolished.

The labour force of the mines is twenty two thousand men, fifteen thousand of whom are employed underground whilst the remaining seven thousand work on the surface.

The following table shows the amount that may be counted upon from each mine under normal working conditions.

Tangshan	3,000 tons per diem
Linsi	4,500 " " "
Machiako	2,500 " " "
Chaokochwang	<u>7,500 " " "</u>

Total for all mines (approximately) 17,500 tons per diem

A new mine, designed to give a daily output of from four to five thousand tons, is now in the process of being equipped at Tangchiachwang, between Chaokochwang and Linsi and when it is in full operation, will materially increase the output of the Kailan Mining Administration.

The actual production of coal during the eleven years that have elapsed since the K.M.A. came into being is as follows:

Year Ending 30th June, 1913	1,700,000 tons
Year Ending 30th June, 1914	2,500,000 tons
Year Ending 30th June, 1915	2,800,000 tons
Year Ending 30th June, 1916	2,900,000 tons

Year Ending 30th June, 1917	3,000,000 tons
Year Ending 30th June, 1918	3,250,000 tons
Year Ending 30th June, 1919	3,400,000 tons
Year Ending 30th June, 1920	4,201,000 tons
Year Ending 30th June, 1921	4,363,900 tons
Year Ending 30th June, 1922	3,874,975 tons
Year Ending 30th June, 1923	4,085,510 tons

The paid up capital of the Lanchow Mining Co. is one million pounds and it has a reserve fund of Tls. 763,477.65 apart from the reserve fund of the Kailan Mining Administration, in which it is entitled to an equal share with the Chinese Engineering and Mining Co. It has also appropriated the sum of \$3,355,036.60 for new business. The gross profit on the trading account of the Kailan Mining Administration for the year 1922/3 was \$9,205,492 and the proportion of the net profit due to the Lanchow Mining Company was \$ 2,796,588 to which must be added a large sum of interest collected during the year. The dividends paid by the latter Company to its shareholders since the formation of the Kailan Mining Administration may be seen from the attached table, which reveals the extent of prosperity enjoyed by the Company in recent years.

First Financial Year	1912/1913	6.2%
Second Financial Year	1913/1914	11%
Third Financial Year	1914/1915	11.5%
Fourth Financial Year	1915/1916	11.5%
Fifth Financial Year	1916/1917	16%

Sixth Financial Year	1917/1918	. . . .	26 ⁰ / ₀
Seventh Financial Year	1918/1919	. . . .	26 ⁰ / ₀
Eighth Financial Year	1919/1920	. . . .	26 ⁰ / ₀
Ninth Financial Year	1920/1921	. . . .	26 ⁰ / ₀
Tenth Financial Year	1921/1922	. . . .	24 ⁰ / ₀
Eleventh Financial Year	1922/1923	. . . .	28 ⁰ / ₀

The figures given below serve to show resources of the mines worked at present. The figures have been compiled in calculating for a certain number of levels only and it is quite possible that, from a technical point of view, coal may be obtained from a lower level, though at a much increased cost.

	<u>Tonnage</u> <u>Extracted</u> <u>to Date</u>	<u>Tonnage Presumed</u> <u>To remain for</u> <u>Extraction</u>	<u>Total Tonnage</u> <u>of the Mines</u> <u>as known at present</u>
Tangshan...	16,035,000	24,845,000	40,880,000
Linsi.....	14,206,000	36,477,000	50,683,000
Machiako...	6,614,000	26,245,000	32,859,000
Chaoko- chwang. . .	<u>12,756,000</u>	<u>63,547,000</u>	<u>76,303,000</u>
	49,611,000	151,114,000	200,725,000

Since 1918, the Company has enjoyed a long and uninterrupted spell of prosperity—a most unusual thing to say of any company in these troublous times—and with the installation of appliances calculated to facilitate production and make it more economical, the future prospects of the joint companies are very bright indeed.

Chinwangtao. The first attempt of the collieries to open up the essential communications with the sea board took the form of a shallow canal, extending to the Tientsin River. Owing to difficulties in bringing the canal right up to Tangshan, a railway had to be constructed from that mine to the head of the canal a few miles away. Some twenty years later, increasing business and the delays and difficulties of navigating Taku Bar drove the Administration to look for some other outlet. The Peking Mukden Railway had by that time been constructed and the choice fell in consequence on Chinwangtao, a deep sea port possessing direct communication with Tangshan by means of the new railway. Large sums of money were expended on the construction of the Harbour, which is now able to accomodate some of the largest vessels sailing to the Far East and which is, consequently, of the greatest value to the mines, since it permits of the economical loading and despatch of their coal.

The Fleet. The Kailan Mining Administration owns two steamers, the "Kaiping" and the "Kwangping" for the transport of its products and usually has another score or so of chartered steamers sailing under its flag and employed on the same service.

Note: The development and success of the Kailan Mining Administration in a large degree was due to the good management and business policies of Major W. S. Nathan who was the executive head of the Administration for about ten years. But as Mr. Chow was the founder of the Lanchow Mining Company, which owns half of the assets of the Administration, I take the liberty to describe here in

full the present condition of the mines it controls, as it may prove interesting reading to those who wish to know more about the largest mining organization in China.

SECTION V.

THE NATIONAL INDUSTRIAL BANK OF CHINA.

In the autumn of the fourth year of the Republic of China, when it was observed that the progress of the country's industries was not what might have been expected, and when it was rightly judged that this tardiness was due to the lack of banking facilities, His Excellency Hsuehsi Chih Chi Chow, then Minister of Finance, ordered regulations to be drawn up providing for the establishment of an industrial bank and submitted them, when ready, to the President for promulgation. At the same time, an office was organised to arrange for the establishment of the bank in question and Mr. Li Shi Wei, then Governor of the Bank of China, was appointed to take charge of the office in question.

The capital of the new bank was fixed at twenty million dollars, to be subscribed equally by the Government and by the Public. The ten million dollars apportioned to the Government were taken up by the Bank of China, while that allotted to the Public was offered for subscription in the various provinces. In the spring of the fifth year when the scheme was still under promotion, civil war commenced in Yunnan and Kueichow and the political disturbance leads to the resignation of Mr. Chow from the government. The opening of the bank was consequently delayed. In the autumn of the following year, the matter was brought up again and the original regulations were slightly altered, the amount to be taken up by the government being reduced to four

million dollars and that offered for public subscription increased to sixteen million. Messrs. Hsuehsi Chih Chi Chow, Hsiung Hsi Ling and Li Shi Wei offered their services in the task of inducing prominent merchants and property owners to take up the six million dollars still unsubscribed. In the spring of the ninth year of the Republic (1920), the bank started operation with an initial paid up capital of two million dollars. The sum of four hundred thousand dollars was handed over to the Directorate of the Bank by the Minister of Finance.

The Head Office was established in Tientsin and branches at Peking, Tsinan, Shanghai and Hankow were subsequently opened. Three sub-organizations were formed, one for insurance, one for savings accounts and one for warehousing. As the name implies, the National Industrial Bank of China is not limited to ordinary banking business but by Article VIII of its constitution it is enabled to carry on other operations designed specially for the assistance of business and industry. Although, owing to its conservative policy, it has not yet engaged in any extensive enterprise of this nature, it is feeling its way forward slowly and cautiously and its weight in the industrial world of China will not be long in making itself felt. Deposits with the Bank have reached the figure of eight million dollars and net profits for the years 1921 and 1922 were \$500,000, in each year.

Article VIII of the Bank's regulations, which gives a fair idea of the sphere of the Bank's activity, is given below :

Section III. Business Operations.

Article VIII. The said Bank may transact business within the following limits.

1. Credits of the following descriptions may be granted to enterprises in connection with plantation, pasturage, irrigation, mining, manufacture, railway and salt business.
 - a) With a mortgage on immovable property, to be repaid in instalments over not more than ten years.
 - b) With a mortgage on immovable property, to be repaid in a fixed period of not more than five years.
 - c) With a mortgage on product, to be repaid within a period of not more than one year.
2. Credit granted with a mortgage on factory plant.
3. Credit granted to guarantee the purchase of goods.
4. Buy and Sell Bills of Exchange and Discount Bills.
5. Act as Agent or as Broker to the buyer or seller of commercial commodities.
6. Act as Agent for the issue of Bonds of the Government or of public institutions.
7. Act as Agent for the issue of shares or debentures of any industrial company, public or private.
8. Organise public audit associations, engage experts in accounting to audit accounts or liquidate estates of industrial companies, public or private. Regulations for this association to be drawn up in detail and sent to the Ministry of Finance for approval.

9. Establish Godowns for storage of goods for merchants and grant loans with lien on goods stored. Regulations for the said godowns to be drawn up apart.
 10. Buy and Sell Gold and Silver Bullion and Foreign Currency.
 11. Accept in safe deposit deeds, documents or other articles of value.
 12. Collect Bills.
 13. Buy Bonds issued by local Industrial Banks.
 14. Receive all kinds of deposits.
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SECTION VI.

THE HWA HSIN BANK

The Hwa Hsin Bank is a new institution, organised and opened in February last (1923). The present paid up capital is one million dollars and, although this may not appear very large for a company of such character, it is backed by several large industrial concerns who lend it their moral support as well as feed it with their deposits. The stockholders of the Company are all capitalists, and the latent resources at the disposal of the bank, should any unfortunate difficulties arise, are considerable. The Head Office is at Tientsin and it is intended to open branches all over the country as business grows.

SECTION VII.

THE PU YU MACHINERY COMPANY, LTD.

The Pu Yu Machinery Co., Ltd. was established in 1921 with a paid up capital of two hundred thousand dollars. With its financial backing and the bank credit it can rely upon, it has been able to operate with an asset value of half a million. It is considered one of the largest machine shops in North China, occupying a site of twelve *mou* of land, in the vicinity of Tientsin. It employs one hundred skilled labourers and one hundred and fifty apprentices. Boilers, Pumps, Lifts, Cotton Gins, Looms, Baling Presses &c have already been turned out and Bridge Construction and Sanitary Fittings have recently been added to the list of lines handled by the company. The Chinese market does not, at present, permit of specialisation and the manufacturer of machinery must be content to take any work he can get. Though this concern may seem very trifling compared with factories abroad, it must be noted that Mr. Chow's idea in fostering the enterprise was not to achieve any instantaneous and remarkable financial success, but to manufacture and thus popularise small hand driven machines for agricultural and manufacturing purposes. The Company has also entered into relations with various firms abroad and imports machinery for the China market. Meanwhile, it is endeavouring to train Chinese workmen to turn out machinery that at present has to be imported.

SECTION VIII.

THE PEITAIHO REALTY INSTITUTE

The Peitaiho Realty Institute is a comparatively small institution with a paid up capital of one hundred thousand dollars. But as Peitaiho is one of the most popular summer resorts in North China, the business of this company is bound to increase from year to year. It controls at present 140 *mou* of land, a large villa, which ranks among the most beautiful in the neighbourhood, seven bungalows, and premises containing twelve rooms for shops. Owing to the increase of the value of land and property at Peitaiho since the company commenced operations, its assets now represent several times the value of the capital they actually set out with.

SECTION IX.

THE CHINA INDUSTRIAL DEVELOPMENT FINANCIERS' SYNDICATE

The China Industrial Development Financiers' Syndicate is an informal and private organisation, which has for its purpose the industrial development of China. It has the honour of possessing a large list of members all of whom are capitalists, industrialists and officials. This institution has already been able to secure remarkable results, for instance, in the Wah Hsing Cotton Spinning and Weaving Co., which was pushed into its present high position through the efforts of the Syndicate.
